Lower East Coast Regional Water Supply Plan

Jim Jackson, AICP Project Manager



Lower East Coast Regional Water Supply Plan

- Overview of LEC Planning Region
- Summary of LEC Plan Results
- Changes in Federal Law since LEC Plan's Completion
- Implication of Changes

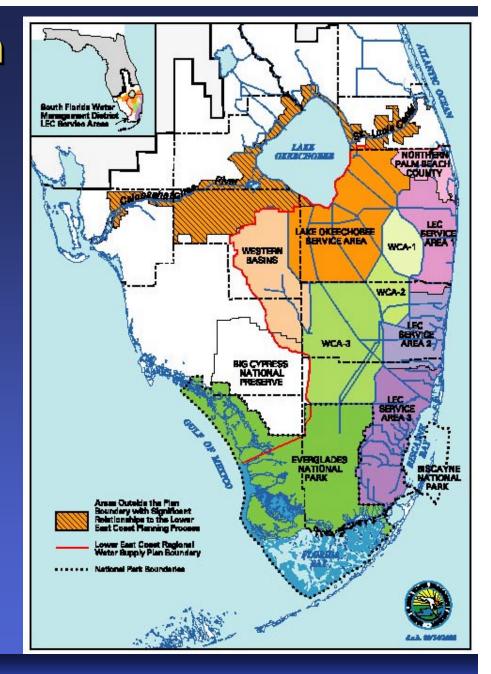
LEC Planning Region

Study area contains:

- ~ 9,000 sq. mi.
- 1995 population 4,756,000
- 2020 population 6,952,000

Includes:

- Miami-Dade County
- Broward County
- Palm Beach County
- Most of Monroe County
- Parts of Lee, Collier, Hendry, Glades, Martin & Okeechobee counties

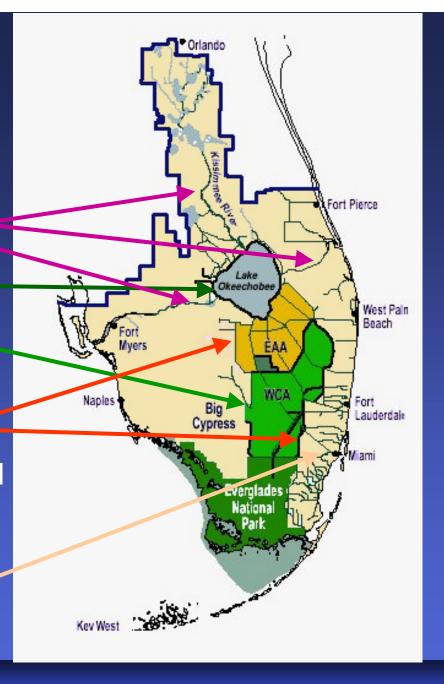


NANDO PASCO Tampa POLK INDIA RIVER HARDEE HIGH CHOBER LUCIE LANDS 3 MARTIN CLADES HENDRY PALM BEAC **Boca Raton** Pompano Beach Fort Lauderdale COLLIER Miami Beach Florida Keys

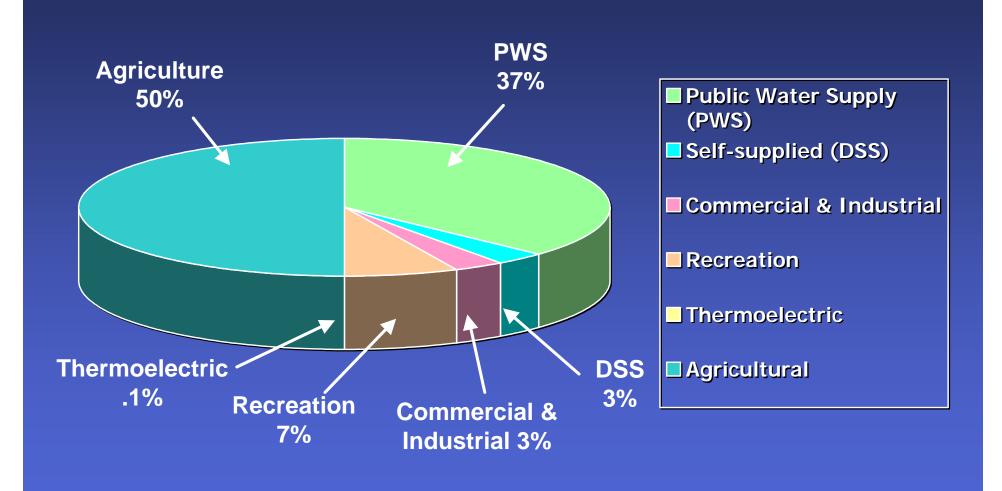
Biscayne Aquifer

Major C&SF Project Components

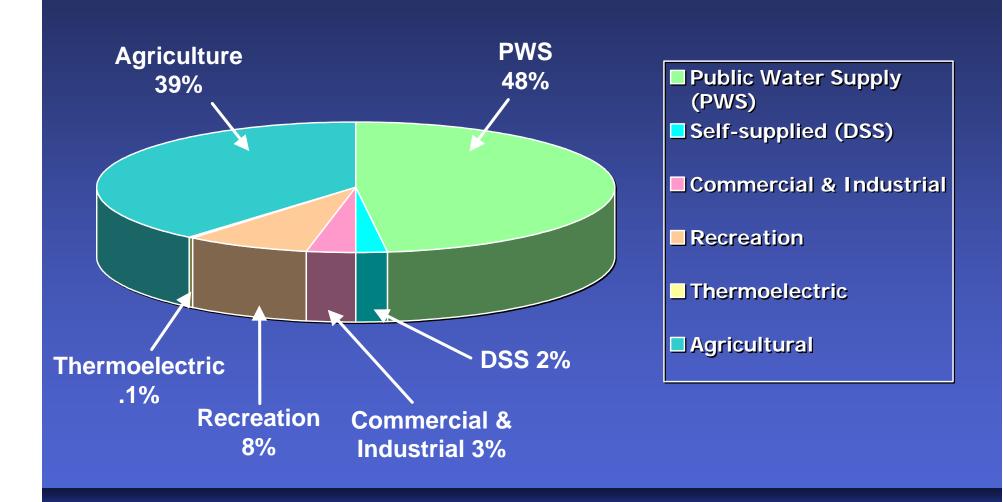
- River Channelization
- Herbert Hoover Dike
- Water Conservation Areas
- Protective Levees
 - Everglades Agricultural Area
 - Lower East Coast
- Drainage Network
 - Salinity Structures



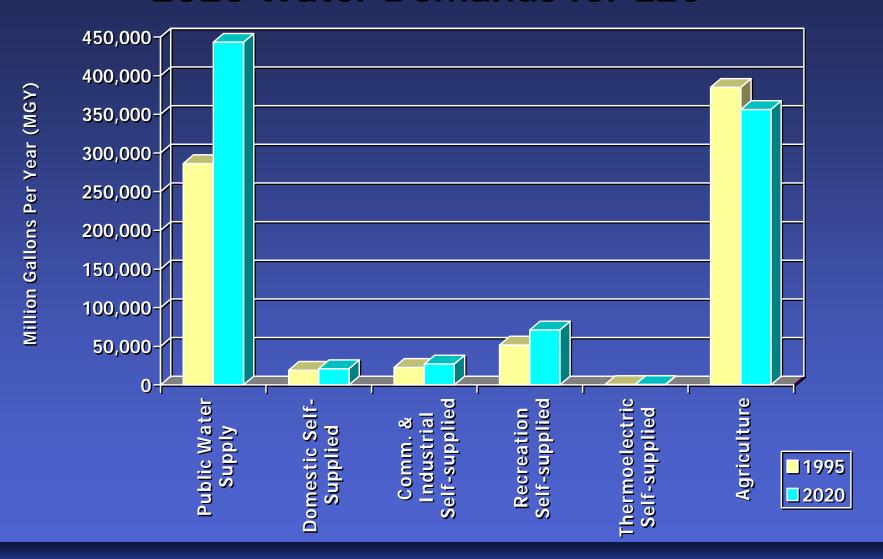
Distribution of Total Estimated Water Demand 1995 for LEC



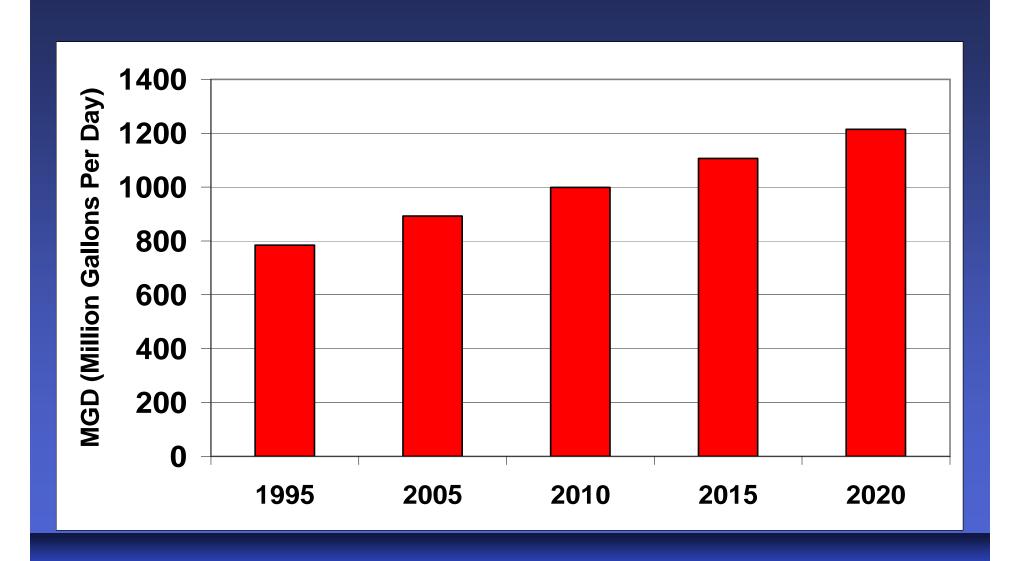
Distribution of Total Projected Water Demand 2020 for LEC



Comparison of Estimated and Projected 2020 Water Demands for LEC



LEC Public Water Supply Demands

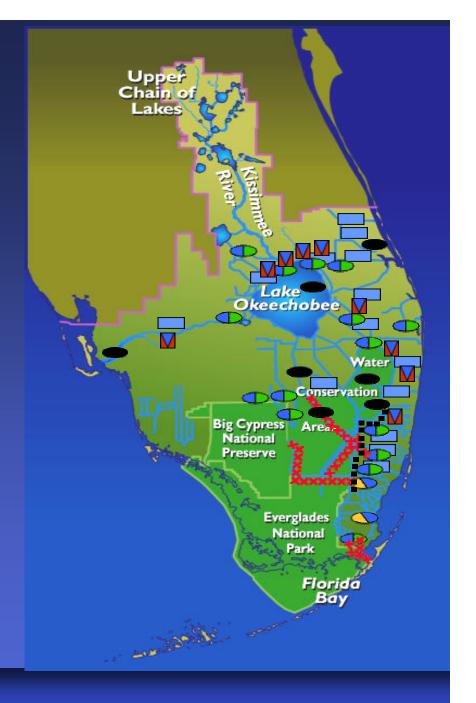


Estimated 1995 and Projected 2020 Public Water Supply Populations for LEC

County	1995 Public Water Supply	2020 Public Water Supply	Percent Change
Palm Beach	809,088	1,577,014	95 %
Broward	1,380,362	1,936,658	40 %
Miami-Dade	1,989,282	3,334,013	60 %
Monroe	78,850	112,800	43 %
Total	4,257,582	6,960,485	63 %

Comprehensive Everglades Restoration Plan

- **Aquifer Storage and Recovery**
- Surface Water Storage Reservoir
 - **Stormwater Treatment Areas** ____
 - **Seepage Management**
 - **Removing Barriers to Sheetflow**
 - **Operational Changes**
 - Reuse Wastewater •







Seepage Management

Component	2005	2010	2015	2002
WCA-3A & 3B Seepage Management		Х	Х	Х
L-31 Levee Seepage Management			X	Х
& Relocation S-356 Structures			X	Х

Shading indicates adjustments in CERP schedule

Storage



Component	2005	2010	2015	2020
C-43 (Caloosahatchee) Basin			X	Х
C-44 (St. Lucie) Basin Storage		Х	X	Х
Reservoir				
North of Lake Okeechobee			X	Х
Reservoir				
EAA Reservoirs-Phase I (Ag.		X	Х	Х
Supply+one 'surge tank'				
EAA Reservoirs-Phase II (second			X	Х
'surge tank')				
C-51 & Southern L-8 reservoir			X	Х
Agricultural Reserve Reservoir				Х
Site-1 (Hillsboro Impoundment)		X	X	X
C-9 Impoundment		X	X	X
C-11 Impoundment		Х	X	Х
North Lakebelt Storage Area				
Central Lakebelt Storage Area				
Bird-Drive Recharge Area			X	Х

ASR



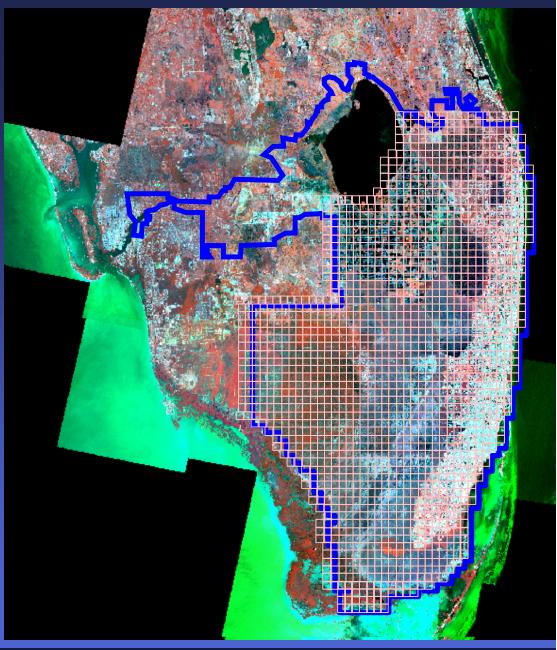
Component	2005	2010	2015	2020
C-43 (Caloosahatchee) ASR				X
Lake Okeechobee ASR				X
WPB Catchment Area ASR				X
C-51 Regional				Х
Groundwater ASR				
Ag. Reserve Reservoir ASR				X
Hillsboro Impoundment				Х
(SITE-1) ASR				
Service Area-3 Utility ASR	X	X	X	X

Additional Lower East Coast Components



Component	2005	2010	2015	2020
L-8 Basin Modifications			X	X
Broward County Secondary Canal		X	X	Х
System				
C-51 Backpumping & Treatment		X	X	X
C-17 Backpumping & Treatment		X	X	Х
C-4 Divide Structure	X	X	X	Х
C-111 N Spreader		X	X	Х
Biscayne Bay Coastal Wetlands				Х
Mart Microsi Doolo Dooroo				F00/

SFWMM Boundary and Grid





SOUTH FLORIDA WATER MANAGEMENT DISTRICT

LEC High Resolution Groundwater Models

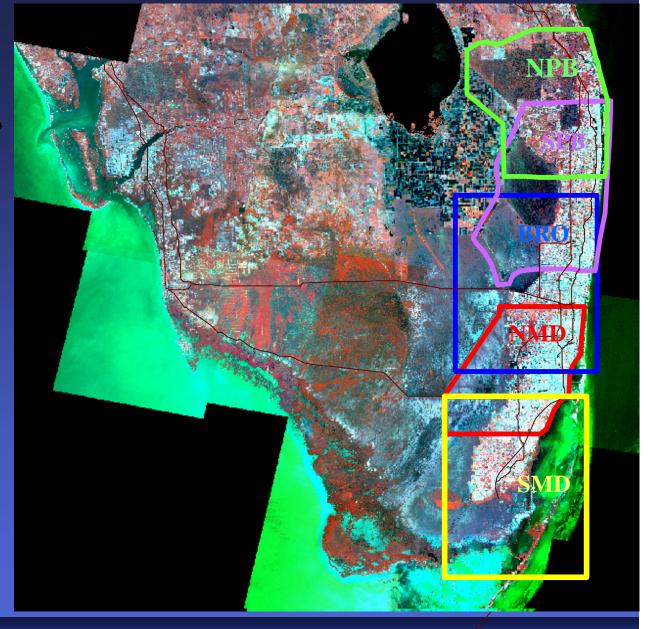
No. Palm Beach

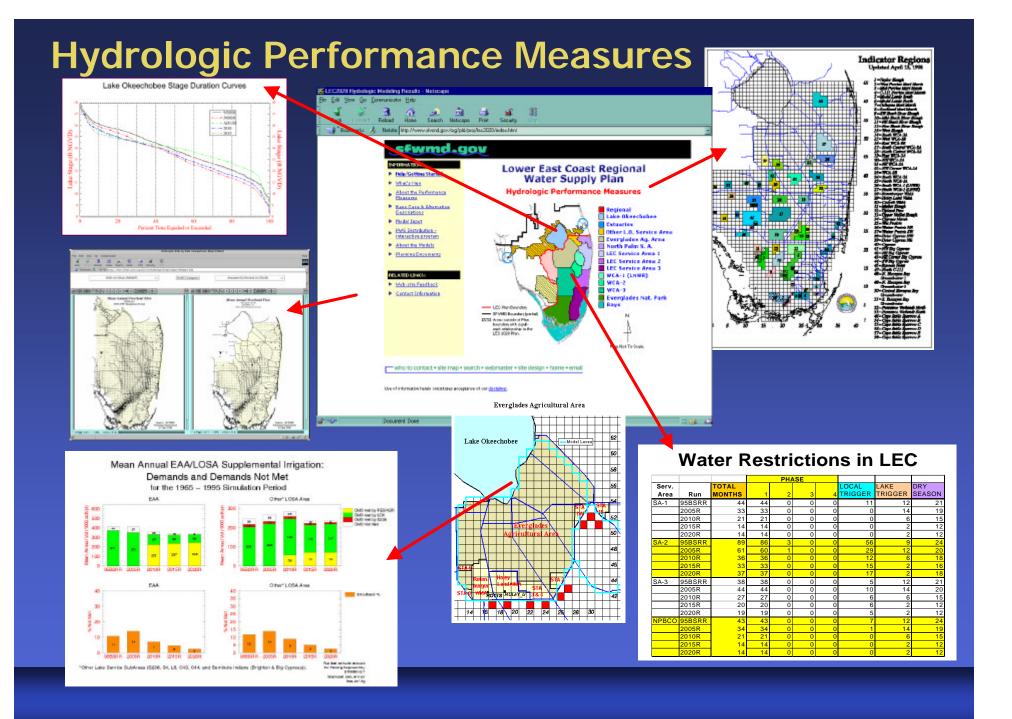
So. Palm Beach

Broward

No. Miami-Dade

So. Miami-Dade





Incremental Modeling Results for LEC Natural Areas

Area	1995 Base	LEC 2005	LEC 2010	LEC 2015	LEC 2020	CERP 2050	
Lake Okeechobee							
Caloosahatchee Estuary							
St. Lucie Estuary							
Lake Worth Lagoon							
Holey Land WMA							
Rotenberger WMA							
			l				
Loxahatchee NWR (WCA-1)							
WCA-2A							
WCA-2B							٨
WCA-3A N.E.							\star
WCA-3A N.W.							
WCA-3A Eastern							
WCA-3A Central							
WCA-3A South							
WCA-3B							\bigstar
Shark River Slough							
Rockland marl marsh							
Western Florida /Whitewater Bay							
North Biscayne Bay							
Central Biscayne Bay							
Southern Biscayne Bay							

Years With Water Restrictions

Service Area	1995 Base	2005	2010	2015	2020 LEC	2050 CERP
North Palm Beach	10	6	3	2	2	2
Palm Beach	12	5	3	2	2	2
Broward	23	16	11	12	13	5
Miami-Dade	8	10	6	5	4	4

Target is 3 years out of 31 years

Lake Okeechobee Service Area Water Restriction Information

Number of water years with significant shortages	1995 Base 5	2005 5	2010 6	2015 3	2020 LEC 1
Number of water years with shortages in one or more months	9	7	9	6	4
Total months of shortages	37	35	36	21	12

LEC Summary

- Incremental modeling shows gradual improvements over time for Urban Water Supply
- Typically water use service areas for LEC meet 1:10 level of certainty by 2020 per ch. 373 goal
- Agriculture essentially meets 1:10 level of certainty by 2015
- LEC Plan assumed that proposed water resource development projects would be constructed on schedule (1999 Restudy)
- LEC Plan also recognized that water supply development projects would be needed in the interim

LEC Water Supply Plan 46 Recommendations

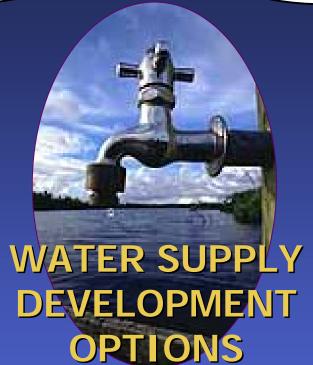
- CERP Projects
- Federal, State and District Projects
- Water Resource Development Projects
- Water Supply Development Options

Conservation

Wastewater Reuse

New Wellfields

Utility Interconnects



Aquifer
Storage
& Recovery

Surface Water Reservoirs

Floridan
Aquifer System

Ocean Water

Water Resources Development Act of 2000

- Approved the Comprehensive Everglades Restoration Plan (CERP)
- Required agreement with State to ensure that environmental water made available by each project in the Plan would not be permitted for a consumptive use until the water for the restoration of the natural system was reserved under State law
- Prohibited the elimination or transfer of existing legal sources of water, including those for agricultural, urban water supply, and the natural system



President and Governor agreement executed on January 9, 2002

.... State shall ensure, by regulation or other appropriate means, that water made available by each project in the Plan shall not be permitted for a consumptive use or

otherwise made unavailable by the State until such time as sufficient reservations of water for the restoration of the natural system are made under State law in accordance with the project implementation report for that project and consistent with the Plan

Identifying Water Made Available by CERP



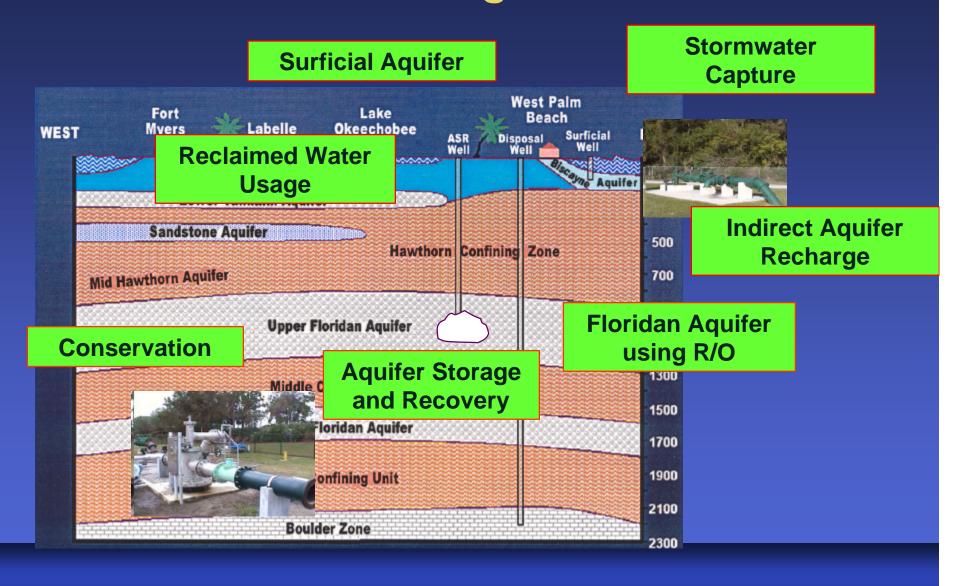
Implication of WRDA on future consumptive uses

- Significant water from the regional system for future population growth will not be available in advance of CERP
- CERP projects providing additional urban water may not be operational for 10-20 years.
- Some CERP project completion dates have been adjusted

Implication of LEC Plan on consumptive uses

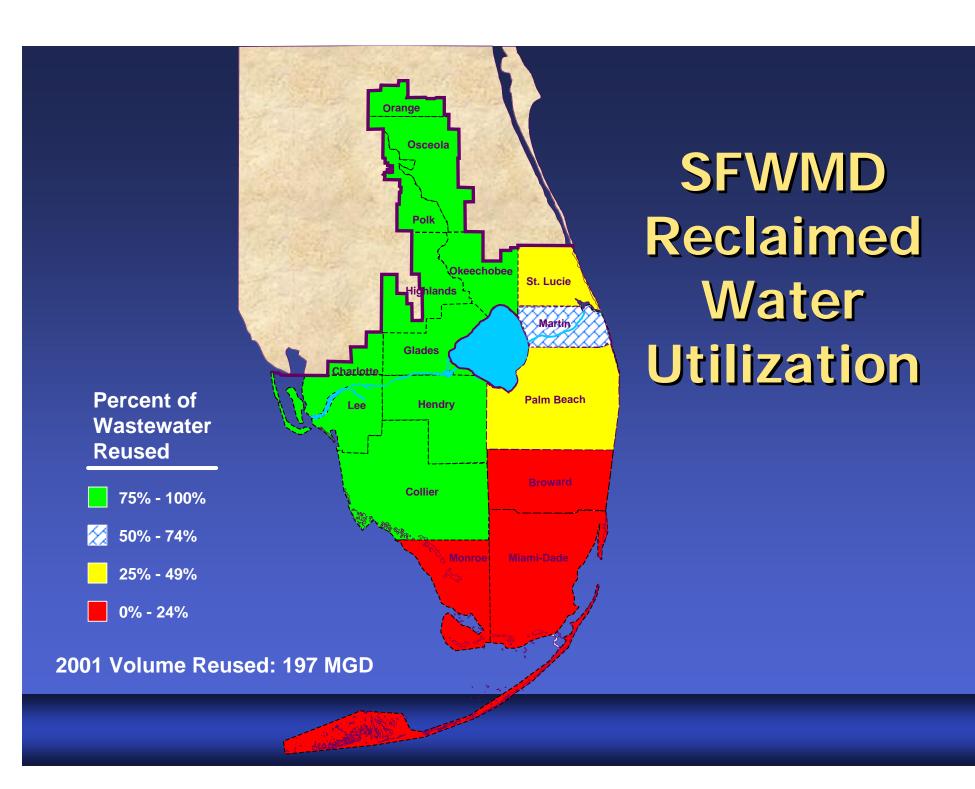
- Future limits on regional water
- Minimum Flows and Levels (MFLs) in the Everglades are not yet being met
 - Recovery plan limits regional water availability
- Reservations of water for the environment are required to be established for CERP under state law
- Uncertainties of water resource development technology and funding

Integrated Water Resource Management Strategies



Integrated Water Resource Management Strategies should be considered in the interim by urban water utilities, IF:

- Utilities are seeking significant increases in allocation from local or regional sources at the time of consumptive use permit renewal
- Utilities demand projections are significantly greater than LEC five year incremental assumptions
- Utilities propose an increase in allocation that has a direct or indirect impact on minimum flows and levels

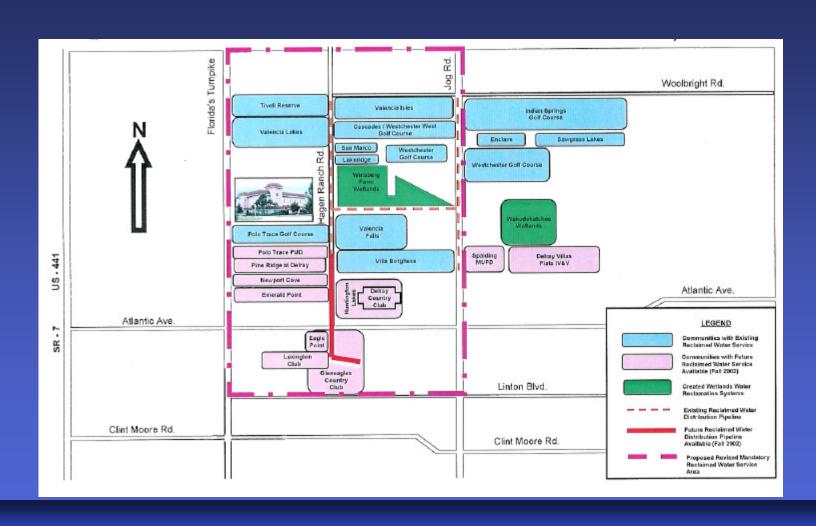


Use of Reclaimed Water for Irrigation





Mandatory Reuse Zone enhances ability to get consumptive use increases



Mandatory Reuse Zones

- Local governments encouraged to establish mandatory reuse zones
- SFWMD consumptive use rules to be revised to require reuse for users within locally designated mandatory reuse zones
- Local governments should consider targeting existing and future users for reclaimed water
- SFWMD/DEP/Utilities to address <u>incentives</u> for voluntary expansion of reclaimed water systems into <u>existing</u> developments

Use of reclaimed water for indirect aquifer recharge

Options:

- Artificial Wetlands
- Recharge canals
- Saltwater barrier

Advantages:

- Resource protection
- Relatively inexpensive disposal



The advantages of alternative water supplies to utilities

- Longer term permits
 - Historic uses without resource problems
 - New non-regional water source
- No cutbacks for alternative supplies during water shortages
- Reduced revenue impacts during shortages
- Reliable source of water supply
- Alternative disposal method for waste water

Recommendations

- Integrated Water Resource Management Strategy:
 - Conservation
 - Efficient distribution of Surficial Wellfields
 - Alternative Source Development
 - Reuse
- Strategies will be included in LEC 2005 Update if completed within 2 years
- District will work with local governments to investigate additional State, Federal, and other Alternative Water Supply funding

LEC Planning Document

- 1. Introduction
- 2. Water Supply Planning Process
- 3. Planning Area Description
- 4. Analysis and Evaluation of Model Results
- 5. Implementation Strategies and Basis for Recommendations
- 6. Recommendations

LEC Appendices Volume 1

- A. Florida Statutes and Administrative Code
- B. Demand Estimates and Projections
- C. Description of CERP Components
- D. Performance Measures Used
- **E. Regional Modeling**
- **F. Subregional Ground Water Models**
- G. Engineering Design and Cost Estimates